

sub 31

WHAT IS CLAIMED IS:

sub 31

1. A controlled debris perforating system, comprising:
2 a pre-fragmented shaped charge having a charge case and an explosive
3 material.
1. The controlled debris perforating system of claim 1, wherein the charge
2 case defines at least one slot.
1. The controlled debris perforating system of claim 2, wherein the at least
2 one slot is axially oriented.
1. The controlled debris perforating system of claim 2, wherein the at least
2 one slot is circumferentially oriented.
1. The controlled debris perforating system of claim 2, wherein the at least
2 one slot is a U-notched groove.
1. The controlled debris perforating system of claim 2, wherein the at least
2 one slot is a V-notched groove.
1. The controlled debris perforating system of claim 2, wherein the at least
2 one slot is an external slot.
1. The controlled debris perforating system of claim 2, wherein the at least
2 one slot is an internal slot.
1. A method of controlling the debris during perforating, comprising:
2 providing a pre-fragmented shaped charge having a charge case defining a
3 plurality of grooves.
1. The method of claim 9, wherein the plurality of grooves are axially
2 oriented.

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1 11. The method of claim 9, wherein the plurality of grooves are
2 circumferentially oriented.

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1 12. A shaped charge made by a process, comprising:
2 inserting an explosive into a case;
3 inserting a liner over the main body of explosive; and
4 machining a plurality of slots in the case.

1 13. The shaped charge made by the process of claim 12, wherein the plurality
2 of slots are U-notched grooves.

1 14. The shaped charge made by the process of claim 12, wherein the plurality
2 of slots are V-notched grooves.

1 15. The shaped charge made by the process of claim 12, wherein the plurality
2 of slots are machined externally.

1 16. The shaped charge made by the process of claim 12, wherein the plurality
2 of slots are machined internally.

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1 17. A method of using one or more pre-fragmented shaped charges in a well,
2 comprising:
3 providing a perforating string having one or more pre-fragmented shaped
4 charges; and
5 conveying the perforating string into the well.

1 18. The method of claim 17, wherein the perforating string comprises a
2 loading tube and carrier.

1 19. The method of claim 17, wherein the perforating string comprises a spiral
2 gun.

1 20. The method of claim 17, wherein the perforating string comprises a strip
2 gun.